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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

In the Matter of	)	
	)	
The Development of Operational,	)	
Technical and Spectrum Requirements	)	
For Meeting Federal, State and Local	)	WT Docket No. 96-86
Public Safety Agency Communication	)	
Requirements Through the Year 2010	)	
	)	
Establishment of Rules and Requirements	)	
For Priority Access Service	)	

COMMENTS OF THE STATE OF FLORIDA

1. The State of Florida, Bureau of Wireless Communications, submits these comments in response to the Second Notice of Proposed Rulemaking (the *Notice*) in the above referenced matter. We commend the Commission for this effort toward satisfying the urgent needs of public safety agencies for additional spectrum. As a licensed user of public safety spectrum, and an agency with regulatory responsibility for other state and local public safety agencies within Florida, we are acutely aware of these needs and have strong interests in this proceeding. At the beginning of each of our numbered paragraphs below, we have referenced in parentheses the paragraph number within the *Notice* to which it refers.

2. (Re: ¶ 56) We strongly urge that analog FM, as recommended in the PSWAC Final Report, be adopted as the baseline transmission standard for voice interoperability, and that the digital standard as provided in Project 25 Phase 1 be adopted for migration as equipment becomes available.

3. (Re: ¶ 57-60) We believe that there is not sufficient spectrum in this band to allocate interoperability channels for image, high-speed data, or video at bandwidths exceeding 150 kHz. We believe that wider bandwidths, such as for full-motion video, be enabled with a separate allocation in a higher frequency band. For data channels providing interoperability at 150 kHz or less, we concur with the proposal for digital modulation standards, and believe that the Project 34 effort may result in the most appropriate standards for public safety.

4. (Re: ¶ 61-66) We recommend that voice interoperability channels be spaced at 12.5 kHz. Consideration of licensees operating in the 806-821 MHz band is not directly applicable since the new interoperability channels cannot be utilized in existing 806-821 MHz equipment due to the band spread. As licensees in the 806-824 MHz bands upgrade their systems, newer radios may then be available which will allow interoperability between 806-824 MHz and 746-806 MHz. As

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stated above, we believe that wide-band interoperability channels should be limited to 150 kHz bandwidth in this frequency band, and that no more than four such channels (two for general data, and two for video) should be allocated on a national basis.

5. (Re: ¶ 67-70) We recommend the following quantities of dedicated interoperability channels be allocated in the new frequency band:

20 duplex voice channels @ 12.5 kHz bandwidth
20 simplex voice channels @ 12.5 kHz bandwidth
2 wide-band data channels @ 150 kHz bandwidth
2 wide-band video channels @ 150 kHz bandwidth

For voice interoperability, the number of channels in this band should be less than the values referenced in paragraph 67 of the *Notice*. To minimize cost of implementation, we recommend that the duplex voice channels be distributed within the spectrum to allow transmitter combining of no less than five channels per combiner, i.e., no less than 250 kHz spacing between each channel of each five-channel group. Since new narrowband equipment will be required for these channels, no "guard" channels will be required as was the case with the NPSPAC mutual aid channels.

The wide-band data and video channels should be distributed in a similar manner to allow transmitter combining, with at least 450 kHz spacing between channels. The distributed spacing does not apply to the simplex voice channels which can be allocated in a continuous group at 12.5 kHz spacing between each channel. We recommend that half of the simplex interoperability channels be reserved for tactical use, and the other half be designated for other simplex uses such as links for vehicular repeaters.

As in the NPSPAC plan, there should be nothing to prohibit individual regions from specifying additional region-specific channels for interoperability needs beyond the nationwide standard. We further recommend that these channels be established as an expansion to the five interoperability channels already established by NPSPAC; the existing nationwide "Calling Channel" (866.0125/821.0125 MHz) would serve as the calling channel for both the old and new interoperability channels.

6. (Re: ¶ 71) We strongly recommend that receiver standards be adopted for the interoperability channels. Without such standards, both communications performance and spectrum efficiency suffer. From our long experience in radio system design, frequency coordination, and management of the NPSPAC band within Florida under the Region-9 Public Safety Plan, receiver standards are essential to insure the system performance and channel re-use that is required in public safety radio communications. Within Florida, receiver standards in the 821-824/866-869 MHz bands have greatly helped to insure both the quality of communications and system performance with the tight geographic spacing that is needed to satisfy the spectrum needs of public safety.

7. (Re: ¶ 72) We concur with the Commission's proposal to require that all mobile and portable radios operating in the 746-806 MHz band be capable of operating on all voice and data interoperability channels in that band. Our experience in the 821-824/866-869 MHz bands confirms that use of the new interoperability channels is facilitated by such a requirement. We recommend that this requirement be extended to equipment operating in the 806-824/866-869 MHz bands only after a suitable time period. We believe that the Commission's suggestion of one year may not be a sufficient time period, and that projections from equipment manufacturers would be needed to arrive at a realistic value.

8. (Re: ¶ 73) We strongly oppose the notion that radios designed for interoperability-only would be a practical solution to technical limitations. Regardless of any other considerations, the cost burden alone would alienate many public safety agencies from the interoperability concept if additional radios and inventory were required.

9. (Re: ¶ 77-82) We recommend that interoperability channels be managed through a combination of nationwide guidelines, with some latitude within individual Regions. Specifically we recommend that of the 20 voice interoperability channels recommended above, two channels should be specified as primarily exclusive for each of the following purposes:

General Coordination
Law Enforcement
Emergency Medical Services
Fire Services
Shared Public Safety/Public Service

In addition, at least 10 voice channels should be specifically defined as tactical channels with their day-to-day or emergency assignment governed by Region Plans. The simplex voice channels should similarly be managed at the Region level.

10. (Re: ¶ 83-84) We do not believe that it is necessary, at a national level, to designate channel distinctions between the general interoperability contexts of day-to-day, mutual aid, and emergency preparedness operations. Issues relating to channel usage for these activities would be best left to the region planning process. The vast majority of interoperability situations occur on a local basis, with the geographic extent of interoperability being limited by radio transmission distances. Based on this and the unpredictability of possible interoperability scenarios, the region planning processes are best equipped to plan for and manage interoperability use. We believe that regions which have the knowledge, experience and planning to properly utilize the distinctions between the interoperability contexts will not need nationwide rules to improve their management.

11. (Re: 85-93) We concur that mechanisms must be established to enable broader use of the interoperability channels than is implied by the Congressional definition of "public safety services", and that such use must include Federal users. Such mechanisms should also be sufficiently broad as to apply equally to the interoperability channels in the 821-824/688-869 MHz bands. It must be clearly established that all use of the interoperability channels shall be in accordance with national and regional interoperability plans.

Within Florida's Region-9 Public Safety Plan, a statewide system of "network control centers" is established to monitor and control communications on the interoperability channels. Each network control center is operated by a primary public safety agency (usually a county sheriff's office) that is tasked with the responsibility to assign, on a real-time basis, specific tactical channels for interoperability between two or more users. We believe that within the general national and regional guidelines, day-to-day management decisions as to the persons or agencies authorized to communicate via the interoperability channels must reside at the local level within the jurisdiction of governmental public safety agencies.

While mobile and portable uses of the interoperability channels may encompass a wide variety of governmental, non-governmental, and Federal agencies depending on the nature of the situation, and while each of these agencies must be permitted to have the interoperability channels within their own radio equipment, we stress that fixed station equipment (mobile relay stations) should only be licensed to governmental public safety agencies.

12. (Re: ¶ 94) We recommend service-specific interoperability channels only to the extent listed in our paragraph 9 above, and the remaining interoperability channels should be for general use. The existing region committees should be given the latitude to make further service-specific or context-specific assignments on either a permanent basis through their region plans, or temporarily as interoperability situations demand.

13. (Re: ¶ 95) We recommend that licensing of interoperability channels be done similarly to that in the NPSPAC band. Mobile and portable radios should not require separate authorizations, but each fixed station must be specifically licensed. Interference considerations demand that fixed stations be engineered and approved in accordance with established regional/national criteria. Without the licensing process for fixed stations, interoperability management at the local, regional, and national levels would become chaos.

14. (Re: ¶ 96-103) We strongly urge the Commission not to mandate trunking on interoperability channels, and furthermore urge the Commission to prohibit trunking on any of the interoperability channels. The number of recommended voice interoperability channels is so modest that trunking is not needed. Due to its higher cost, a requirement for trunking of interoperability channels would alienate many potential users. To gain wide acceptance, interoperability channels must be usable in the simplest and most affordable equipment available. Due to the mobility required of emergency operations, particularly following natural disasters, interoperability must not be based on highly complex fixed-station equipment as is required for trunking. Transportable mobile relay stations, as have been used in Florida for emergency operations, are essential for interoperability, and do not lend themselves to trunking.

15. (Re: ¶ 104-107) Regarding technical standards for interoperability, we strongly urge the Commission to adopt conventional 12.5 kHz FDMA as the analog baseline, and allow migration toward a digital standard which provides backward compatibility. We further urge the Commission to adopt the Project 25 Phase 1 (12.5 kHz) common air interface as the digital standard for voice interoperability, which should be mandated for inclusion in any digital voice

equipment in this band regardless of other modes or technologies which may be employed. Trunking should be excluded from interoperability standards for the reasons stated in our paragraph 13 above.

16. (Re: ¶ 111) Florida completely concurs with the Commission's proposal to use the regional planning approach for the new frequency band. Within Florida (Region-9), the region planning process has functioned successfully since the inception of the National Public Safety Plan, and can continue its functions with the additional spectrum in the 746-806 MHz band. Within Florida, the regional processes have functioned independently of, but in concert with, the frequency coordinators, and we believe that this can successfully continue with the new band. We see no need for any connections beyond a voluntary association between regional committees and the frequency coordinators.

17. (Re: ¶ 113-114) We know of no reason to change the current regional boundary definitions unless specific regions request it.

18. (Re: ¶ 115-119) We concur with the Commission's proposals to retain the existing regional committees, to require a new regional notification process for the new band, to maintain the current requirements for regional plan content, and to maintain the current requirements for regional plan review, approval and modification. All of these processes have functioned successfully from our point of view within Region-9. With regard to adjacent-region approval of regional plan modifications, we believe that this process should continue. Within Region-9, plan modifications occur at roughly one-year intervals, with a lengthy preparation and review time. We believe that adjacent-region concurrence does not appreciably impact the time required to execute plan modifications, and that the process should continue.

19. (Re: ¶ 130-139) We recommend that the new frequency band incorporate non-interoperability channels for the following types of communications and channel spacings in the quantities listed:

Number of Channels	Type of Communications	Bandwidth (kHz)
288	General-use duplex voice	12.5
100	State-use duplex voice	12.5
168	Unassigned duplex voice	12.5
24	Wide-band data	150
12	Medium-width data	25

We recommend that the 100 voice channels for "state-use" be specifically assigned for statewide public safety communications systems, and that this assignment be maintained for at least five years following the availability of licenses in the new band. This would give state agency systems, which have the longest lead-time of any public safety communications, a sufficient time to confirm their usage of the frequencies and begin implementation. If no plan for state use has been

submitted to the regional committee within the five-year timeframe, the regional committee may reassign any unused channels to the "general-use" or other category.

To minimize cost of implementation, we recommend that both the "general-use" and "state-use" duplex voice channels be distributed within the spectrum to allow transmitter combining of no less than five channels per combiner, i.e., there should be no less than 250 kHz spacing between each channel of each five-channel group. The "wide-band data" channels should be distributed in a similar manner to allow transmitter combining, with at least 450 kHz spacing between channels.

We recommend that about 4.2 MHz (the equivalent of 168 duplex channels at 12.5 kHz) be reserved for future assignment by the regional committees upon exhaustion of any of the other categories.

We recommend that the "wide-band data" channels not be further defined as to the type of use. Allowed uses may include any data transmissions including image content or slow-motion video.

We recommend the "medium-width data" channels (25 kHz) be arranged so as to allow their future consolidation into wide-band (150 kHz) channels, i.e., each set of 12 of the 25 kHz channels should be contiguous within one 150 kHz section of spectrum. If there is insufficient use of the "medium-width data" channels within a time frame of perhaps 5 years, the channels may be consolidated by the regional committee for "wide-band data" or reconfigured for other use.

In view of existing broadcast television stations currently operating on TV channels 63, 64, 68, and 69, we strongly urge the Commission to adopt a band plan which splits all allocations equally between the TV channel 63/68 portion and the TV channel 64/69 portion, i.e., exactly half of the total channels of each type should be created in each half of the available spectrum. If this is done, areas which have an exiting broadcast station on channel 63 for example, but not on 64 or 69, would have access to all of the types of public safety channels, but in half the quantity. This would allow use of the spectrum for public safety sooner than if, for example, all of the duplex voice channels were generated from channel 63.

20. (Re: ¶ 140-150) We believe that the Commission should adopt a channel scheme using the quantities shown in our paragraph 19 above, and believe that the individual regions be given the latitude to make further decisions as to specific uses. We further recommend that regions be given the latitude (via the plan modification process) to "aggregate" and "disaggregate" spectrum on a case-by-case basis. We concur with the Commission's proposal that for duplex pairs, the base frequencies should be contained within the TV channel 63/64 portion, and mobile frequencies within the TV channel 68/69 portion.

21. (Re: ¶ 151-152) We recommend that all duplex voice channel assignments be made on an exclusive rather than shared basis. Due to the relatively limited number of channels for wide-band use, we recommend that no more than half of those channels be allocated for exclusive use, and that the remainder be shared. For the wide-band channels designated for exclusive use, we recommend that each application include a showing which justifies an exclusive assignment.

22. (Re: ¶ 153-154) We concur with the Commission's proposal to allow licensees to choose from among the available analog or digital transmission technologies for their authorized channels. However, we strongly encourage the Commission to adopt the Project 25 (Phase 1) standard as the baseline for digital voice communication, but such that no other technology is excluded. We believe that adoption of the Project 25 standard will be the only realistic means by which system interoperability in its broadest sense can be realized. Any two agencies with totally incompatible technologies will suffer a lack of interoperability equivalent to that experienced by two agencies in different frequency bands. Since a goal of this spectrum allocation is to solve that problem, a baseline digital standard such as Project 25 Phase 1 is the best (and perhaps only) way to fully accomplish it within the 800 MHz band.

23. (Re: ¶ 155) As to the effect on the non-interoperability channels which may be caused by a trunking standard on the interoperability channels, we reiterate that we strongly oppose even the allowance of trunking on the interoperability channels.

24. (Re: ¶ 156-157) We strongly believe that receiver standards are needed not only on the interoperability channels, but on the regular channels as well. We believe that standards for interoperability radios would tend toward defacto standards for all receivers in the band, but believe that reliance on defacto standards is insufficient. Many of the large public safety agencies are sufficiently knowledgeable to avoid the degradation caused by inferior receivers, but the vast majority, contrary to the Commission's opinion, are not "in the best position to determine whether the receiver performance satisfies their needs." The vast majority have no experience or knowledge of system engineering, frequency coordination, channel re-use, receiver selectivity, or desensitization. They depend on agencies like ourselves, user advocate groups, and the FCC to somehow make everything work. Our knowledge as engineers, and long experience in frequency coordination, confirms that receiver quality is one of the key factors in making everything work, and that the lack of receiver standards will disrupt even the most carefully laid channel re-use or frequency coordination plans. We strongly encourage the Commission to adopt receiver standards for all radios in the 746-806 MHz band.

25. (Re: ¶ 158) We see no persuasive reason to require all public safety mobile and portable radios to be capable of operating on the commercial channels within 746-806 MHz. Such a requirement would increase the cost to all users while providing benefit to only a few. We recommend that such capability be determined by market demand.

26. (Re: ¶ 161) We recommend that the maximum authorized bandwidth on the 12.5 kHz channels be 11.25 kHz to reduce adjacent-channel interference.

27. (Re: ¶ 162) We believe that the Commission, not the individual regions, should determine the channel spacings of the general-use channels.

28. (Re: ¶ 165) We believe that the individual regions should determine the power and antenna height limits, if any, to be applied within their regions. Regions requiring greater channel re-use may elect to incorporate such limits in their regional plan. Emission masks and frequency stabilities however, like channel spacings, should be determined by the Commission.

29. (Re: ¶ 166) We recommend that the Commission specify a minimum interference protection criteria, but such that individual regions could adopt a more stringent standard in their regional plan if needed. A minimum criteria of 40 dBμV/m desired to 30 dBμV/m undesired would be appropriate for a baseline standard, provided that a standard model such as Okumura or R-6602 were used for the analysis. Individual regions should have the latitude to utilize more suitable models, or to modify the criteria values according to the needs within their regions.

30. (Re: ¶ 167-169) We strongly urge the Commission to apply an "extended implementation" construction requirement of not less than three years for the 746-806 MHz band due to the newer and more complex technologies involved, and that larger system implementations, such as for region or statewide use, should be routinely be allowed five or even ten years, depending on the scope of the project.

31. In conclusion, we commend the Commission's for its efforts on behalf of public safety, but express again our overall concern that much of the proposed allocation may be unusable in the immediate future in many of the areas in which it is most needed due to existing television broadcast operations. We urge the Commission to pursue all options which maximize the availability of usable channels to public safety in the shortest possible timeframe.

Respectfully submitted,

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